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# CANADIAN PATENT

## SEPARABLE LOOP FASTENER

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This invention relates to wearing apparel, which expression should be understood to include body-attachments such as inflatable life-jackets, and has for its object to provide an improved means whereby one garment may be fastened to a separate garment or body-attachment, or two parts of the same garment or body-attachment fastened together, in a very secure but readily-releasable manner.

The increasing complexity of the equipment worn by flying personnel, especially those required to operate at high altitudes, and the importance of the wearer being able to utilize or disuse certain items of such equipment at short notice and with a minimum of interference from other items, has given rise to the modern preference for releasably connecting two or more items together so that they can be put on or taken off as a single garment.

Hitherto it has been usual in this connection to employ fastening means of the sliding-clasp type, but whilst such fasteners are often satisfactory for connecting two edges of the same item, they cannot necessarily be

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4 pulled upon to withstand the stresses imposed when the wearer is explosively ejected from his aircraft, or to maintain secure integration of two separate items, which may possibly 8 separate from different makers, under shock loading such as may result from immersion of a person whose outer garment has an inflated life-jacket adjoined thereto. Furthermore, the slide fasteners at present available are liable to jam or become inoperable as a result of sea-water corrosion or accumulation of foreign matter therein.

12 The improved fastening means according to the present invention comprises webbing or other loops attached at spaced positions along those parts of two separate items of wearing- 16 apparel, or of the same item, which require connection together and a nylon or other flexible rod adapted to be passed through the two sets of loops after interdigititation of the latter.

20 For convenience of insertion and withdrawal, the rod aforesaid may be moulded integrally with an arrow-head at one end and a handle at the other.

In the accompanying drawings;

24 Fig. 1 is a perspective view showing the two sets of loops and a connecting rod in course of engage-

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ment therewith,

Fig. 1 is a perspective view  
showing the improved fastening  
means employed for integration  
4 of an inflatable life-jacket  
to a flying overall,

FIGS. 2 & 4 are similar views  
8 showing the improved fastening  
means employed to close different  
forms of pocket.

In the example illustrated in Fig. 1, the  
12 invention is applied to the attachment together  
of two fabric edges 5, 6, not necessarily of the  
same item.

The edge 5 is provided with a row of spaced  
16 tabs 7 each comprising a short length of nylon or  
other webbing which is folded and sewn in position  
to provide a flat dependent loop (say)  $\frac{1}{2}$  inch in  
length.

20 A similar row of webbing loops 8 is sewn to  
the edge 6 and extends upwardly so that, on  
juxtaposition of the two edges, its members will  
interdigitate with the first set of loops 7.

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In connection together of the two edges 5, 6 is effected by threading a flexible rod 9 through the interdigitated loops 7, 8, it being 4 convenient in this connection to employ nylon, polyethylene or other tough plastic moulded to provide an arrow-head 10 and a pull-ring 11 or T-piece at opposite ends of a shank 12 of 8 suitable length.

Normally the two sets of loops 7, 8 will 12 be of equal overall length, and the members thereof suitably spaced for easy interdigititation as aforesaid, 1-inch wide webbing being used except for the loop 7<sub>a</sub> at one end of one set and the loop 8<sub>a</sub> at the opposite end of the other set, 16 which are preferably of narrower width (say,  $\frac{1}{2}$  inch) to limit the tendency for the closure to gape at those points.

The arrow-head 10 may be of skeletal 20 formation so that it can deform resiliently, if necessary, during its passage through the loops and preferably the end loop 7<sub>a</sub> or 8<sub>a</sub> through which the arrow-head 10 last passes is made relatively short to ensure such deformation of 24 the arrow-head and thus to resist accidental return movement of the rod 9.

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4 To reduce friction during insertion of the rod 9 the latter's shank portion 12 at least may be moulded to a cruciform or other ribbed section measuring (say)  $\frac{7}{16}$  inch wide overall.

8 A moulded plastic rod such as that above described is easy to insert even when the interdigitated rows of loops 7, 8 are curved; for example, around the body of the wearer, and although involving no discomfort or interference with body movements, it provides a connection between the associated parts or items which is adequately secure against any snagging or shock load (due for example to ejection, parachute opening, or other jolting movement) to which it may be subjected in use.

16 At the same time the fastening means is very easily released by a pull applied to the ring or handle 11 of the rod in any convenient direction, whereas the known slide fasteners, apart 20 from their tendency to jam, will yield only to a substantially lengthwise pull on the slider which it may be difficult or impossible to apply when the integrated items are being worn.

24 More, however, the integrated items will normally be separated only at long intervals

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(as for servicing purposes), it is preferred to form the rod with a small T-piece instead of the ring 11 and to arrange for the skeletal arrow-head 10 thereof to be engagable with a non-metallic headed stud on one or other of the two parts or items, so that a positive lock is obtained.

In Fig. 2, the fastening means above described is employed for the integration to an airmen's outer garment, such as a flying overall 13 or a pressurizable jerkin or suit, an inflatable life-jacket of the type whose buoyancy chamber is normally stored in a pouch 14 extending across the back and under the arms of the wearer. On inflation by means of a gas-bottle 15 or otherwise the chamber aforesaid will develop to rupture pre-arranged scuring the pouch and thereafter may provide two front lobes which meet across the wearer's chest, as will be a support for the back of the head and neck.

In this case, a row of the loops 7 is securely attached to a webbing band 16 covering the inner side of each underarm portion of the pouch 14 and co-operates with a row of loops 8 attached to the adjacent reinforced portion of the garment 13, two of the connecting rods 9 being inserted in an outwards direction as shown to hold

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the life-jacket in position.

Obviously the improved fastening means can equally well be employed for securing together two edges of a single item; for example, the edges of a pocket 17, which in Fig. 3 is utilized to hold the beacon unit of personal radio equipment and in Fig. 4 provides stowage for the speech unit of the same.

One set of the loops may be sewn in between two thicknesses of material forming the adjacent pocket edge, whilst the second set is similarly positioned or set back somewhat from the other edge of the material if the latter is to be overlapped by the first-mentioned edge.

If desired, that edge of the pocket 17 which carries the set-back loops aforesaid may be represented by a narrow strip of material sewn to the body of the associated garment or item, and in this case the inserted rod 9 will be substantially concealed from view.

Furthermore the complete pocket 17 and its securing rod 9 may be covered by a flap 18 fastened by press-studs 19, as in Fig. 3, or a tab 20 on the pocket 17 may be press-studded to the body of the associated garment or item, through the pull-ring 11 of the rod 9, as shown in Fig. 4.

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1 The embodiments of the invention in which an  
exclusive property or privilege is claimed are defined  
as follows:

5 1. Means for releasably connecting adjacent  
edges of two garment items comprising a plurality of  
spaced loops of substantial width extending laterally from  
the edges of said items, the loops of one of said items being  
interdigitated with the loops of the other of said items,  
10 releasable connecting means threaded through substantially  
all of said loops, said means comprising a flexible rod  
having an arrow-head on one end and a handle on the other  
and to prevent accidental displacement thereof.

15 2. Releasable connecting means according  
to Claim 1, further characterized in that said arrow-head is  
of skeletal formation to permit resilient deformation of said  
head during passage of the latter through the loops.

20 3. Releasable connecting means according to Claim  
1 or 2, further characterized in that the shank portion  
of said flexible rod is of ribbed cross-section.

25 4. Releasable connecting means according  
to Claim 1 or 2 further characterized in that the two sets  
of loops are equal in number, the loop at one end of one  
set and the loop at the opposite end of the other set are  
substantially narrower than the remaining loops.

5. Releasable securing means according to  
Claim 1 or 2, further characterized in that one end of the  
flexible rod is adapted, when fully inserted, for detachable  
engagement with a headed stud on one of the connected parts.

30 6. Releasable securing means according to  
Claim 1 or 2, further characterized in that, on full

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invention of the flexible rod, the parts connected by the latter can be detachably fastened directly together, by means of a screw-blud, through an opening in one end of said rod.

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